CLAIMS

What is claimed is:

1. A system for controlling the density of a drilling fluid in a wellbore in well drilling operations, comprising:

a first drill tube having a top end and a bottom end, the top end of said first drill tube being located at the surface, the bottom end of said first drill tube being located in the wellbore, said first drill tube for delivering a drilling fluid having a predetermined density from the surface to the wellbore, said first drill tube having a predetermined outer diameter; and

a second drill tube having a top end and a bottom end, the top end of said second drill tube being located at the surface and the bottom end of said second drill tube being located in the wellbore, said second drill tube having a predetermined inner diameter which is greater than the outer diameter of the first drill tube, said second drill tube being arranged such that the first drill tube is contained within the second drill tube to define an annular space between the outer diameter of the first drill tube and the inner diameter of the second drill tube, said second drill tube comprising at least one set of ports for establishing communication between the annular space within the second drill tube and the wellbore, said second drill tube for delivering a base fluid having a predetermined density from the surface to the wellbore via the set of ports to create a combination fluid, said base fluid having a density different than the predetermined density of the drilling fluid, said combination fluid having a predetermined density that is defined by a selected ratio of the drilling fluid and the base fluid, said combination fluid rising to the surface.

2. The system of claim 1, further comprising:

a drilling device connected to the bottom end of the first drill tube;

a drilling rig located at the surface to facilitate offshore drilling operations; and

a riser having an upper end connected to the drilling rig and a lower end connected to the wellbore, said riser for delivering the combination fluid from the wellbore to the drilling rig at the surface.

3. The system of claim 2, further comprising a separation unit located at the surface for separating the combination fluid into a base fluid component and a drilling fluid component.

4. The system of claim 1 wherein the predetermined density of the base fluid is less than the predetermined density of the drilling fluid.

5. The system of claim 4, wherein the predetermined density of the drilling fluid is adapted to facilitate overbalanced drilling operations.

6. The system of claim 1 wherein the predetermined density of the base fluid is greater than the predetermined density of the drilling fluid.

7. The system of claim 6, wherein the predetermined density of the drilling fluid is adapted to facilitate underbalanced drilling operations.

8. The system of claim 6, wherein the predetermined density of the drilling fluid is adapted to facilitate near-balanced drilling operations.

9. The system of claim 2 wherein the predetermined density of the base fluid is less than the predetermined density of the drilling fluid.

10. The system of claim 9, wherein the predetermined density of the drilling fluid is adapted to facilitate overbalanced drilling operations.

11. The system of claim 2 wherein the predetermined density of the base fluid is greater than the predetermined density of the drilling fluid.

12. The system of claim 11, wherein the predetermined density of the drilling fluid is adapted to facilitate underbalanced drilling operations.

13. The system of claim 11, wherein the predetermined density of the drilling fluid is adapted to facilitate near-balanced drilling operations.

14. The system of claim 11, further comprising:

a rotating head device connected to the lower end of the riser, said rotating head device for blocking return flow of the combination fluid from the wellbore into the riser when actuated; and

a return line having an upper end located at the surface and a lower end connected to the rotating head device, said return line for establishing communication between the surface and the wellbore to facilitate delivery of the combination fluid from the wellbore to the surface when the rotating head device is actuated.

15. The system of claim 1, wherein the second drill tube comprises a plurality of sets of ports, each set of ports arranged at predetermined axially spaced locations along the length of the

second drill tube and being movable between an open port position to establish communication between the annular space within the second drill tube and the wellbore and a closed port position to interrupt communication between the annular space within the second drill tube and the wellbore.

16. The system of claim 15, further comprising means for opening and closing each set of ports in the second drill tube such that the base fluid may be injected into the wellbore at selected depths.

17. A system for controlling the density of a drilling fluid in a wellbore in well drilling operations, comprising:

a first drill tube having a top end and a bottom end, the top end of said first drill tube being located at the surface, the bottom end of said first drill tube being located in the wellbore, said first drill tube having a predetermined outer diameter, said first drill tube comprising at least one set of port channels for establishing communication between the predetermined outer diameter of the first drill tube and the wellbore, said first drill tube for delivering a base fluid having a predetermined density from the surface to the wellbore via the set of port channels; and

a second drill tube having a top end and a bottom end, the top end of said second drill tube being located at the surface and the bottom end of said second drill tube being located in the wellbore, said second drill tube having a predetermined inner diameter which is greater than the outer diameter of the first drill tube, said second drill tube being arranged such that the first drill tube is contained within the second drill tube to define an annular space between the outer diameter of the first drill tube and the inner diameter of the second drill tube, said second drill tube for delivering a drilling fluid having a predetermined density from the surface to the wellbore to create a

combination fluid, said drilling fluid having a density different than the predetermined density of the base fluid, said combination fluid having a predetermined density that is defined by a selected ratio of the drilling fluid and the base fluid, said combination fluid rising to the surface.

18. The system of claim 17, further comprising:

a drilling device connected to the bottom end of the second drill tube;

a drilling rig located at the surface to facilitate offshore drilling operations; and

a riser having an upper end connected to the drilling rig and a lower end connected to the wellbore, said riser for delivering the combination fluid from the wellbore to the drilling rig at the surface.

19. The system of claim 18, further comprising a separation unit located at the surface for separating the combination fluid into the base fluid component and the drilling fluid component.

20. The system of claim 17 wherein the predetermined density of the base fluid is less than the predetermined density of the drilling fluid.

21. The system of claim 20, wherein the predetermined density of the drilling fluid is adapted to facilitate overbalanced drilling operations.

22. The system of claim 17 wherein the predetermined density of the base fluid is greater than the predetermined density of the drilling fluid.

23. The system of claim 22, wherein the predetermined density of the drilling fluid is adapted to facilitate underbalanced drilling operations.

24. The system of claim 22, wherein the predetermined density of the drilling fluid is adapted to facilitate near-balanced drilling operations.

25. The system of claim 18 wherein the predetermined density of the base fluid is less than the predetermined density of the drilling fluid.

26. The system of claim 25, wherein the predetermined density of the drilling fluid is adapted to facilitate overbalanced drilling operations.

27. The system of claim 18 wherein the predetermined density of the base fluid is greater than the predetermined density of the drilling fluid.

28. The system of claim 27, wherein the predetermined density of the drilling fluid is adapted to facilitate underbalanced drilling operations.

29. The system of claim 27, wherein the predetermined density of the drilling fluid is adapted to facilitate near-balanced drilling operations.

30. The system of claim 27, further comprising:

a rotating head device connected to the lower end of the riser, said rotating head device for blocking return flow of the combination fluid from the wellbore into the riser when actuated; and

a return line having an upper end located at the surface and a lower end connected to the rotating head device, said return line for establishing communication between the surface and the wellbore to facilitate delivery of the combination fluid from the wellbore to the surface when the rotating head device is actuated.

31. The system of claim 17, wherein the first drill tube comprises a plurality of sets of port channels, each set of port channels arranged at predetermined axially spaced locations along the length of the first drill tube and being movable between an open port channel position to establish communication between the outside diameter of the first drill tube and the wellbore and a closed port channel position to interrupt communication between the outside diameter of the first drill tube and the wellbore.

32. The system of claim 31, further comprising means for opening and closing each set of port channels in the first drill tube such that the base fluid may be injected into the wellbore at selected depths.